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Coolies Cultivating Soybeans in Manchuria

In oriental countries the farmers plant, cultivate, and harvest soybeans by hand, as their ancestors did before them.

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World Map—Production of Soybeans

The annual average world production of soybeans during 1935–39 was 464 million bushels, whereas in 1946 the world crop amounted to 517 million bushels.

NEWS NOTES

FitzGerald Named to ECA Post

Dr. D. A. FitzGerald, whose appointment to be Director of the Office of Foreign Agricultural Relations recently was announced by Secretary Anderson, was chosen on April 16 to head the Food Division of the Economic Cooperation Administration.

Dr. FitzGerald will continue to provide direction to the OFAR while carrying on the ECA assignment, in view of the close relationships between the work of the OFAR and that of the Food Division of ECA.

In announcing Dr. FitzGerald's return to the Department after a leave of absence since 1946, Secretary Anderson said that the Department feels fortunate in obtaining the services of an individual who has such a broad background of knowledge of the world's agriculture. Paul Hoffman, ECA Administrator, referred to Dr. FitzGerald as "probably the world's greatest authority on procurement of foodstuffs."

Unanimously elected in June 1946 by member nations of the International Emergency Food Council to be Secretary General of this agency, he assumed the responsibilities of an office that was concerned with world-wide food problems. Special assignments gave him opportunities to study first hand such problems in various parts of the world.

As Chief Food Consultant, he accompanied ex-President Hoover on President Truman's World Food Mission to 38 nations suffering from food shortages. Similarly, he went to Germany and Austria on the President's Economic Mission, and later, as a Special Consultant to the Secretary of War, he visited the Combined U. S.-U. K. Zones of Germany to examine food, marketing, and general economic conditions.

Prior to this service in the field of postwar food and agricultural problems, Dr. FitzGerald had served the Department of Agriculture and the War Food Administration in various capacities in broad economic fields from 1935 onward.

His early training includes many years of study in various phases of agriculture. He received his master's degree in 1925 from Iowa State College, where he worked as Research Assistant and as a Marketing Specialist for some years thereafter. Following study at Harvard University, from which he later received his doctor's degree, he came to Washington in 1933 for research at Brookings Institution.

FOREIGN AGRICULTURE HALLY H. CONRAD, EDITOR

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Soybeans Yesterday and Today

Since remote times soybeans have ranked high in the agriculture of the Far East. Recently introduced to the West, they have achieved notable success in the United States, which now occupies first place in world soybean production.

by W. J. MORSE

The early history of the soybean (*Glycine max* (L.) Merrill), an annual summer leguminous plant, native of southeastern Asia, like many other food plants, is lost in obscurity. Ancient Chinese literature, however, reveals that the soybean was extensively cultivated and highly valued as a food centuries before written records were kept. The first written record of the plant is contained in a materia medica describing the plants of China, written by Emperor Sheng Nung in 2838 B. C. The soybean is repeatedly mentioned in ancient and modern records with innumerable references on methods of culture, varieties for different purposes, and numerous uses for food and medicinal purposes. It was considered the most important cultivated legume and was one of the five sacred grains—rice, wheat, soybeans, barley, and millet—essential to the existence of Chinese civilization. Available historical records indicate that it is one of the oldest crops grown by man.

The soybean, therefore, has been grown to a greater extent in Asiatic countries than in any other part of the world. China led all other nations in acreage and production, and Manchuria, commonly called the "Land of the Soybean," was a close second during prewar years. The United States, however, following a great expansion of acreage and production in 1942, has advanced to world leadership.

Interest in the soybean and its products—oil and oil meal—spread rapidly to the Western World after World War I. This interest gradually increased, and during World War II the soybean became a highly essential and vital crop in the international war-emergency program. At the present time agricultural experiment stations of all nations are engaged in the development of varieties adapted to the various soil and climatic conditions of their respective countries and in studies on fertilization, culture, and harvest for economical production. Successful results have been obtained in several countries, but only in a few has the crop become an important factor in their national agriculture.

The principal regions of soybean production in the Orient are China, Manchuria, Korea, and Japan. In China the soybean is one of the leading and most ancient of crops, ranking fifth in extent of culture and occupying about 9 percent of the total cultivated area. Although grown everywhere in China, about 60 percent of the soybean acreage and production is confined largely to three northern Provinces, Shantung, Kiangsu, and Honan. China consumes practically all its production, estimates indicating 55 percent for food, 27 percent for oil extraction and other purposes, 10 percent for stock feed, and 8 percent for planting.

The soybean occupies about 25 percent of the total cultivated area of Manchuria and is a dominating factor in the life of that country. As a cash crop, it provides fully half the total volume of freight handled by Manchurian railroads. Estimates have indicated that from one-third to two-thirds of the production of soybeans was exported; 15 to 20 percent utilized for food, feed, and planting; and the remainder processed for oil and oil meal.

Korea occupies third place among the soybean-producing countries of Asia. Acreage and production

Manchurian soybeans being loaded on a freighter at the Dairen wharves for shipment to European oil mills.

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are confined largely to the central and northern areas, because southern Korea, growing chiefly cotton and rice, seems less well adapted to soybean-seed production. The entire seed production is used for food, stock feed, export, and planting, none being used for oil extraction.

Japan, although a large producer of soybeans, has consumed all its own production and imported large quantities of seed from Manchuria and Korea. Since World War I, production of soybeans in Japan has decreased to some extent, more emphasis being placed on the greater production of rice. The proportion of soybeans used by Japan for various purposes was: Miso (soybean-rice fermented paste), 22 percent; soy sauce, 22 percent; oil and oil cake, 21.5 percent; bean curd, 15.5 percent; confections, 7.2 percent; forage, 6.2 percent; green manure, 2.5 percent; seed, 1.8 percent; green vegetable beans, 0.8 percent; and miscellaneous 0.5 percent.

In the Soviet Far East the soybean is said to be one of the chief industrial crops and in some districts to constitute 20 percent of the cultivated area. Acreage and production have increased markedly since 1926, especially in the Khabarovsk territory.

South of China the soybean is cultivated more or less in the Netherlands Indies, India, Siam, Cochinchina, the Philippines, and Australia. With the development of improved varieties, acreage and production have increased rapidly, and from 1932 until 1936 beans were exported from the Netherlands Indies to the Netherlands. In India the soybean has been considered more for its forage and food values than for growing as an oilseed. In Australia successful results have been obtained in seed production, especially in the States of Queensland, New South Wales, and Victoria.

Planting soybeans on ridged rows in Manchuria.

Soybeans are quite generally planted along the edges of rice paddies in oriental countries and used for home consumption.

Attempts to grow soybeans in European countries have extended over many years, but it is only within recent years that there has been any appreciable production. Acreage at the present time is confined largely to European U. S. S. R., Bulgaria, Yugoslavia, Rumania, Austria, and Czechoslovakia. In the development of adapted varieties, some progress has been made in Sweden, Poland, the Netherlands, and Hungary. Scientists of the U. S. S. R. have carried on extensive tests in the development of adapted varieties and in utilization of the crop. The principal areas of production are the Ukraine, Moldavia, and certain regions of the Caucasus.

Although experiments with soybeans have extended over a period of years in nearly all regions of Africa, as yet it is an unfamiliar crop to most African farmers. Successful results have been obtained in the upland, midland, and coastal districts of Natal, in Gambia, Nigeria, Egypt, the Gold Coast Colony, and in the corn- and cotton-growing districts of Belgian Congo.

The soybean has been experimented with for many years in nearly all countries of the Americas. Little progress has been made, however, in commercial production, except in the United States and Canada. In the United States there are three rather distinct regions of soybean production—North Central, Mississippi Delta (Mississippi, Arkansas, Louisiana, and southeastern Missouri), and Middle Atlantic Coast. Seed production is largely concentrated in the north central region, where nine States—Illinois, Iowa, Indiana, Ohio, Missouri, Minnesota, Kansas, Michigan, and Wisconsin—produced 92 percent of the record crop of 201,275,000 bushels in 1946. Of the Middle Atlantic States, North Carolina, Virginia, Maryland, and Delaware are the chief seed-producers.

In Korea, as well as in many other oriental countries, bamboo flails are used in threshing soybeans.

The phenomenal increase in acreage and production in the United States may be attributed to the following factors: Improved, adapted varieties for industrial uses; mechanization of the handling of the crop through improved machinery for seeding, cultivating, and harvesting; one of the most profitable cash grain crops; less damage from diseases and insect pests than other common crops; dependable producer of forage and grain under adverse weather conditions; a legume fitting favorably into Corn Belt rotations and crop-control programs; and available industrial markets.

In oriental countries the soybean is grown primarily for the seed, which is used largely in the preparation of numerous fresh, fermented, and dried food products. For centuries the protein part of the diet of millions of oriental people has been supplied or supplemented, to a great extent, from soybean products. Fermented, the soybean yields all the different sauces which furnish the basic flavoring of their food; pressed, it gives oil for cooking; sprouted, it furnishes a fresh vegetable rich in vitamins; picked when green, it makes an excellent green vegetable; ground dry, it makes flour; soaked, ground, and mixed with water, it provides bean milk, and the curdled milk furnishes bean curd—the boneless meat of the Orient—used in the form of various cheeses and as a meat substitute. The roasted beans are often salted; they are also used in cakes and candies; fermented bean pastes are used in soups and in preserving vegetables; and boiled beans are mixed with millet, rice, or kaoliang. The soybean has meant bread, meat, milk, cheese, and vegetables to these peoples and furnished what is said to be a well-balanced diet at a relatively low cost.

Although the people of Asiatic countries have long appreciated the many uses of the soybean for food, it is only within comparatively recent years that the people of the Western World have awakened to the potential utilization of this unique legume as food. The importance of legumes as an economical source of protein in the human diet has become quite generally recognized throughout the world. The soybean, in view of its richness in digestible nutrients—as indicated partly by its unusually large percentages of protein and fat—deserves high rank as a food. European scientists for many years have realized the high nutritional value of soybean protein and fat, and Europe has been one of the principal importers of soybeans from Manchuria and the United States. During World War II Germany published an army field cookbook containing nearly 300 recipes in which full fat soy flour was used to supplement meat, milk, eggs, and cheese in the soldiers' diet. Since the close of the war millions of pounds of soy flour, as well as considerable quantities of beans, have been sent to European and oriental countries.

The soybean has been considered primarily as a forage crop in the United States, but during the past few years remarkable progress has been made in developing food and industrial uses of the soybean.

Soybeans are harvested by hand in all the soybean-producing countries of the Orient.

At present 140 oil mills are crushing soybeans; about 200 concerns are manufacturing or processing soybean food products; and more than 100 manufacturers are turning out various industrial products from this bean.

Soybean foods receiving the most attention at the present time are flour, flakes, grits, and oil. Improvement in processing during the past few years has resulted in the manufacture of soy flours that are much superior in flavor and keeping qualities to those first placed on the American market. Three general types of soy flour are now available—full or high fat (20 percent fat and 40 percent protein); medium fat (5 to 7 percent fat and 45 to 48 percent protein); and low fat (approximately 1 percent fat and 50 to 53 percent protein).

Soy flour differs from wheat flour in many ways. It is lacking in gluten and very low in starch and cannot be used alone for bread or other baked products. Primarily a protein concentrate, soy flour's principal use is to add nutritive value to other foods.

Soy flour, grits, and flakes are used extensively, not only in the United States but in several European countries, especially Great Britain and Russia, with wheat flour in bakery goods, macaroni, and other paste goods; in soups, candies, ice-cream powders, prepared baking mixes, breakfast foods, confections; and as an extender in various meat products. Soy flakes are used to a considerable extent in the brewing of beer. Other foods on the market are baked soybeans, canned and quick-frozen green-vegetable soybeans, soy butter, bean curd, diabetic foods, meat-like products, milk substitute (liquid and powder), soy sauce, sandwich spreads, and infant foods. In addition to its many uses for human food, soy flour has been successfully used as a pollen supplement in the winter feeding of bees.

Vegetable soybeans, which are now grown in all sections of the soybean-growing region of the United States, are being used extensively for shelled green-vegetable soybeans in home gardens and by canning and quick-freezing companies.

The soybean has now become firmly established in the industrial world, and the oil produced from the bean has come to fill a highly important place not only in the domestic but also in the international vegetable-oil supply and economy. Nearly all soybeans entering commercial channels in the United States are processed for the purpose of obtaining the

The combine has been one of the important factors in the economic production of soybeans in the United States.

General view of a Chinese oil-mill yard in Manchuria, showing mill, storage of soybeans in osier bins, and steel tanks.

oil, leaving a high-protein residue for use as stock feed, flour, and industrial products. Three methods are ordinarily employed for processing soybeans for oil; namely, continuous pressing (expeller and screw presses), hydraulic press, and solvent extraction. At present the use of expeller and screw presses is by far the most common; but in the North Central States, where soybean processing is centralized, solvent extraction is increasing.

Previous to 1935 soybean oil in the United States was utilized chiefly in soap, paint, and varnish. Since that time, however, 70 to 85 percent of the soybean-oil supply has been used in the food industries. Soybean oil possesses a combination of properties that qualify it as an ingredient of a wide variety of manufactured products, such as vegetable shortening, margarine, salad oil, soap, cleaning compound, disinfectant, foundry oil, paint, enamel, varnish, linoleum, oilcloth, printing ink, grease and lubricating compounds, rubber substitutes, patent and artificial leather, waterproof fabric, glycerin, lecithin, medicinal oil, sticker for sprays, waterproofing cement, pharmaceuticals, cosmetics, food modifier, special emulsifier, petroleum products, plastic compositions, and textiles.

Soybean meal, remaining after the beans are processed for oil, is a most valuable product and has wide usefulness. It is a highly concentrated and nutritious feed and food and is extensively fed to all kinds of livestock, poultry, and fur-bearing animals in America and in European countries. In the Orient the principal use of the oil meal is for fertilizing purposes—rice and truck crops—but it also serves as a feed for work animals. The industrial utilization of soybean meal is still in the early stage of development, and the tonnage used at present is relatively small. Industrial products in which the meal is used include adhesives, textile fiber (artificial wool), spreader for insect spray, finishing wax, paper-sizing material, celluloid substitutes, plastics, water paint, and waterproofing for textiles.

Although much research has been devoted to the composition of soybean seed, one may say that only its grossest aspects are known and much is yet to be learned of the finer and less obvious details of its chemical structure. A well-known fact is that the seed comprise principally protein (29 to 52 percent), oil (12 to 24 percent), fiber (3 to 6 percent), carbohydrates (22 to 30 percent), and minerals (3 to 6 percent). The principal protein of the soybean is glycinin of which the content of amino acids is similar to the value of casein, the principal protein of milk. Soybean oil contains a variety of mixed fatty acids, glycerides, and phosphatides, as well as unsaponifiable materials, such as sterols, ketones, and hydrocarbons. The carbohydrates are present in the form of sugars, cellulose, and various glycosides. Soybeans have a higher mineral content than many other common legumes and grains. The seed also contains many other constituents, such as pigments, vitamins, enzymes, and antioxidant bodies, many of which have never been isolated in pure form. Little is therefore known concerning their structure, function, and use. Other substances are undoubtedly present in soybean seed, but only through continued research may their identity and usefulness be known.

The soybean has become one of the most valuable, if not the most valuable, of China's gifts to the Western World. Because of the almost unbelievable multiplicity and variety of uses, it is said that a more versatile plant has never been known to science. With an ever-expanding and amazing versatility, it has risen from a little-known plant immigrant to a vitally important and almost indispensable place in our agricultural and industrial economy.

The Coffee-Harvest Timetable in Latin America

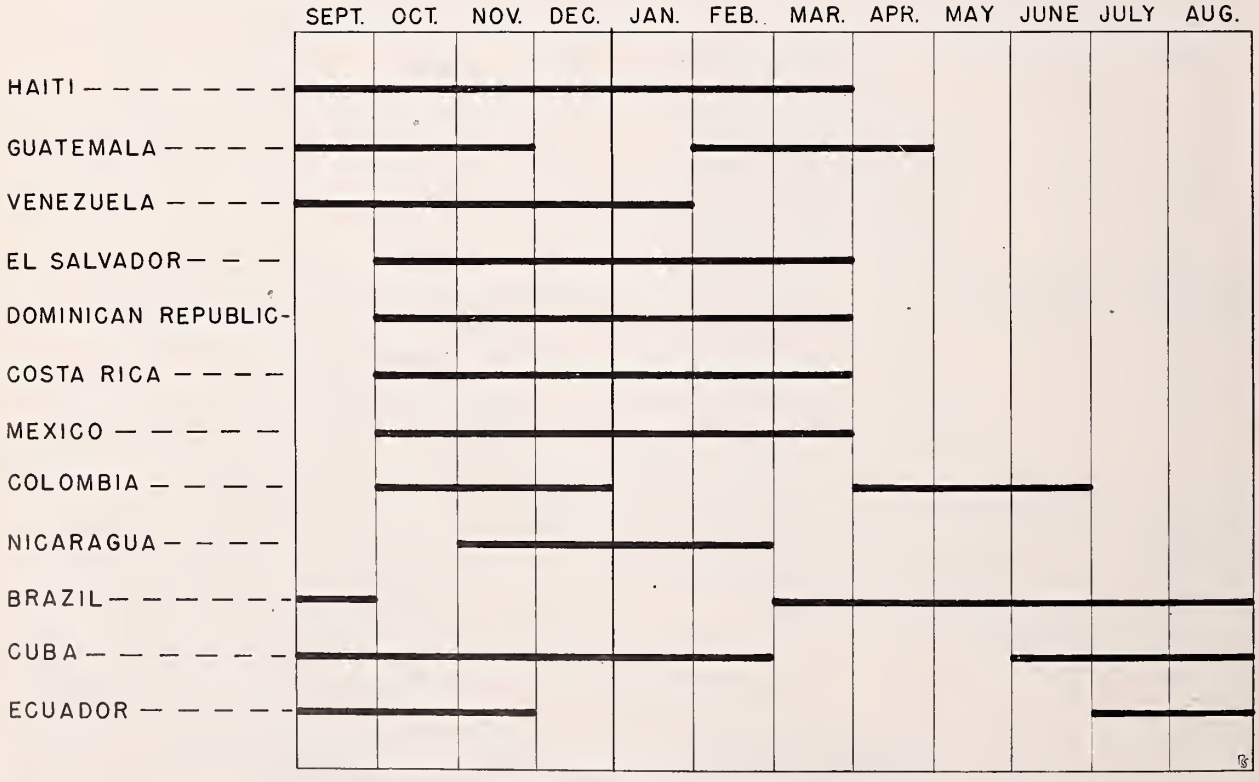
by MARY S. COINER

The harvesting of coffee in the Western Hemisphere begins around the first of September in Haiti and moves south, getting progressively later until completion of the São Paulo harvest at the end of the following August. In certain of the coffee-producing countries the harvesting of ripe cherries [1] is carried on throughout the year. Nevertheless, there are seasons during which the heaviest part of the crop is harvested, a minor crop being taken off a few months later. The cherries are ready for harvesting in 8 or 9 months after the trees flower. Length of the ripening period varies with climate and altitude.

Harvest of Brazil's voluminous crop begins as soon after the close of the rainy season as possible, as early as the middle of March in Espírito Santo and Rio de Janeiro. Even though coffee begins to ripen in January and February, harvesting is not begun until most of the beans are ripe. Then the branches of the trees are stripped of all berries, as well as many leaves and twigs. The coffee is then swept up from the ground—along with considerable quantities of trash. Some cleaning is done on the spot before the coffee is hauled to headquarters for further processing. Harvesting seasons in Madagascar, Java, and Jamaica coincide with the main Brazilian harvest, from the middle of March through July or August.

Contrary to the method of stripping the coffee from the trees as practiced in Brazil, Colombia's fine coffee is carefully picked, one ripe berry at a time; overripe, green, or imperfect berries are rejected. In Magdalena, Antioquia, Santander, and northern Caldas the large harvest begins in October and extends through December. In the other Departments the large harvest comes in April, May, and June.

[1] The fruit or berry of the coffee tree is often called a cherry. The beans are the seed of the fruit.



Harvesting seasons of coffee in Latin American countries.

Coffee is usually harvested by hand.

Coffee sacked and dropped between rows of trees.

Coffee plantations in Venezuela are widely scattered, not concentrated into belts as in Central American and Mexico. In the Andean States the principal harvest is in May, whereas in central and eastern Venezuela the months of September through March comprise the main season.

Central American types of coffee may be described in a general way as mild in flavor and of rich body. Most of them are grown at altitudes above 2,000 feet and are shade-grown. In Costa Rica, harvesting methods are similar to those followed in Colombia. Trees are picked over several times during the season, only perfectly ripened berries being taken off. The season lasts from October to March. Guatemalan coffee is also carefully picked, no green, damaged, or dried berries being included. Certain characteristics peculiar to Guatemala's coffee are a result of wide variations in altitude and type of soil on which the trees are grown. Sometimes coffee well-known in the market by the name of the plantation from which it comes will bring a price slightly higher than the current one. The bulk of the crop comes off in September through November at lower elevations and from February through April at higher elevations.

Mary S. Coiner is a member of the staff of the Extension and Training Division, Technical Collaboration Branch, OFAR.

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Grade for grade, Salvador's coffee matches that of Guatemala. Harvest begins in October, reaches its peak from November through January, and continues through March. Mexico's coffees show a wide range of characteristics, some of them comparing with the fine Colombian and Central American types, and others more nearly resembling the lower grade Brazilians. The coffee berries are ripe by October, and the harvest lasts until February or March.

The harvesting seasons in other producing areas of the world which correspond to those in the Western Hemisphere are: The Arabian season, September–March, which is identical to the Haitian season and fits in with the September–January season in Venezuela and the October–March season of El Salvador, Dominican Republic, Costa Rica, and Mexico; the Angolan harvest, beginning in June and corresponding to the Cuban and Ecuadoran; and the large Ethiopian harvest in December–February, corresponding to the Nicaraguan season.

Since the coffee bean comprises only 26 percent of the ripe coffee cherry, a great amount of waste, composed of pulp and parchment, is left from the hulling process. In the past most of this waste was simply thrown away, but sometimes it was scattered under the trees as fertilizer or burned as fuel. Studies have been made by scientists of United States Department of Agriculture to determine the value of the pulp as feed for livestock. If its value is fully proved, coffee pulp should offer an additional source of income to coffee growers and solve the problem of disposal as well.

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Russian Grain on the International Scene

by LAZAR VOLIN

The great food stringency in European countries, the problem of economic relations between eastern and western Europe posed by the Marshall Plan, and the recently concluded International Wheat Agreement all combine to focus public attention on the revival of Russian grain exports. A brief historical review of Russian grain-export trade, therefore, may be of value.

Before the First World War, Russia was the foremost exporter of grains in the world, shipping on the average close to 11 million long tons annually during the 5 years ending in June 1914. (See table 1.) Grain exports were the principal international economic asset of Russia during the late nineteenth and the early twentieth century and formed the main prop of the country's balance of international payments.

With the First World War and the ensuing revolution, Russian grain exports ceased and did not appear again on the world market until the middle 1920's. But, with revolutionary changes in the Russian agricultural economy and the increased population, grain shipments during the two inter-war decades (which like all Russian foreign trade became a Soviet state monopoly) were on a much smaller scale than before the First World War, and they fluctuated much more widely, practically vanishing in years of poor crops.

Only during the 1930–31 and 1931–32 seasons, when the Soviet Government, disregarding starvation at home, pushed exports to finance the imports required by the ambitious industrialization program of the first Five-Year Plan, did grain shipments reach as much as 4 or 5 million tons. This was the period of the so-called dumping of Russian grain. Whether or not it was "dumping" in a technical sense, the fact remains that the relatively heavy Russian exports further aggravated the world agricultural depression of that time. But the figures of the best inter-war years fell far short of the level of even the poorest season (1907–08), prior to the First World War, when about 6 million tons were exported. (See tables 1 and 2.) The specter of low-cost Russian grain from huge mechanized state and collective farms flooding the world market failed to materialize. While during the years 1909–13, Russian shipments of the five grains constituted 30 percent of world exports, during 1934–38 they accounted for less than 5 percent.

It is indicative of the lessened importance of grain in Russia's foreign trade that, whereas such shipments accounted for over 40 percent of the total value of Russian exports during 1909–13, they constituted only 13 percent during 1929–32 (the period of the first Five-Year Plan) and dropped to 9 percent during 1933–37 (the second Five-Year Plan).

Wheat and barley have always predominated in Russian grain exports. Wheat, which accounted for over 40 percent of the total grain exports before the First World War, increased to more than half the much smaller total during the 5 years ending in June 1938; whereas barley, which accounted for nearly 35 percent before the First World War, decreased to around a fourth. Rye and oats shipments, though large in absolute size in the heyday of Russian grain exports, prior to the First World War, trailed far behind wheat and barley. Corn exports were always small.

Russian grain exports were again in the international spotlight during the period of Soviet-Nazi collaboration, 1939–41, when the Soviet Government shipped grain to Germany. What the Nazis thought of this aid was emphasized by a high German Foreign Office

TABLE 1.—*Exports of specified grains and flour from the Soviet Union, 1904–08 to 1937–38*

Year beginning July 1	Wheat, including flour	Rye, including flour	Oats	Barley	Corn	Total grain and flour
	Million bushels	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Thousand long tons*
Average:						
1904–08	125.3	38.7	72.7	114.6	20.3	8,324
1909–13	165.7	34.5	70.8	172.9	28.4	10,726
1923–27	20.6	17.3	1.9	15.1	5.8	1,480
Annual:						
1928–29	(1)	(1)	(1)	0.0	0.0	(2)
1929–30	8.7	7.2	4.3	24.0	1.4	1,023
1930–31	111.8	29.1	33.8	49.8	2.5	5,335
1931–32	71.8	43.3	14.6	37.5	10.9	4,290
1932–33	19.7	9.6	1.7	16.6	8.5	1,360
1933–34	33.8	5.8	8.7	25.9	5.1	1,857
1934–35	4.3	1.2	9.1	6.6	(1)	417
1935–36	29.7	2.8	10.4	29.2	.3	1,648
1936–37	4.5	4.2	.4	1.7	.0	268
1937–38	43.3	12.8	.2	10.9	.0	1,716

[1] Less than 50,000 bushels.
[2] Less than 500 long tons.

Dr. Volin is a Regional Specialist in the Office of Foreign Agricultural Relations.

TABLE 2.—*Exports of bread grains, coarse grains, and all grains from the Soviet Union, averages 1909–13 and 1923–27 to 1933–37*

Year beginning July 1	Bread grains	Coarse grains	All grains
	1,000 long tons	*1,000 long tons*	*1,000 long tons*
Average:			
1909–13	5,300	5,426	10,726
1923–27	983	497	1,480
1928–32	1,581	823	2,404
1933–37	754	430	1,184

functionary, who was responsible for economic relations with the Soviet Union. On May 15, 1941, or less than 6 weeks before the Nazi invasion of Russia, he wrote in a secret memorandum: [1]

The quantities of raw materials now contracted for are being delivered punctually by the Russians, despite the heavy burden this imposes on them, which, especially with regard to grain, is a notable performance, since the total quantity of grain to be delivered under the agreement of April 10 of this year and the Belgian and Norwegian agreements, amounts to over 3 million tons up to August 1, 1942.

From a voluntary supplier of Germany, Russia became an involuntary source of grain following the Nazi invasion, because at its peak the invasion extended over a territory comprising about 40 percent of the most fertile cropland of the U. S. S. R. German troops lived on the country, and some grain was shipped from the occupied zone to Germany.

A year after the end of the war with Germany, Russia returned to the international grain scene by agreeing, on April 6, 1946, to sell to France 400,000 tons of wheat and 100,000 tons of barley. The Soviet communique stressed the desire of the U. S. S. R., from its own "limited resources," to help an ally in a difficult food situation, "since Great Britain was not able to supply France with grain, and the United States could not fully supply French requirements." However, observers agreed that political considerations—the desire to bolster the position of the Communist Party in France on the eve of important parliamentary elections—largely motivated this transaction. At any rate, much publicity was given to Russian grain shipments by French Communists, who capitalized on the "generosity" of the Soviets. Actually, the Soviets were reported to have been well paid in American dollars, and much of the Russian grain was hauled in American ships.

Soviet export operations in 1946 did not go beyond shipments to France and smaller exports to Finland, because the grain and food situation was extremely strained as a result of a poor harvest in the U. S. S. R.

With a better harvest in 1947, the Kremlin was able to develop a significant export program. It is true that grain production in 1947 was still only about four-fifths of the prewar outturn. The Kremlin, however, pursued a most stringent grain-procurement campaign in 1947. It collected not only the annual tax in kind (which is levied on each hectare, about 2.5 acres, of the arable land) and the payments in kind for services of the state machine-tractor stations, supplying tractors and implements to the collective farms, but also the arrears for the previous year. Furthermore, it secured, in many cases, advance payments for the work of the state machine-tractor stations due from the next harvest. Thus, Molotov was able to state, at the celebration of the thirtieth anniversary of the Soviet regime in November 1947, that grain procurements from the 1947 harvest approximately equaled those of the best prewar years, when production was considerably above that of 1947.

In addition to this rigorous collection program, the Government postponed the long-promised abandonment of rationing until mid-December 1947. But derationing was accompanied by a drastic devaluation of currency, which reduced the purchasing power in the hands of the population; and the price of bread, which was trebled in September 1946, was lowered by only 12 percent. Thus, domestic consumption was kept down, and the Government was able to accumulate considerable quantities of grain, which made possible sizable exports.

The export commitments through March 1948, amounted to more than 3.4 million long tons of grain, of which over 1.9 million were bread grains (wheat and rye). The remainder comprised coarse grains (barley, oats, and corn). (See table 3.) The delivery period specified in the commitments varies, running until the autumn in the case of some countries, such as Great Britain for instance, and even extending for Belgium till the end of the year. While exports under the present program may involve therefore some quantities from the new 1948 harvest, the bulk would have to come from the harvest gathered last year. Additional commitments may be made before the marketing year ends on June 30, 1948, but the actual movement of grain is not likely to be large.

In any event, actual exports of the five principal grains through the year ending June 30, 1948, will be well above the average for the inter-war period but considerably smaller than during the peak inter-war years, 1930–31 and 1931–32, when shipments exceeded 5 and 4 million tons, respectively, not to mention the

[1] SONTAG, RAYMOND JAMES, and BEDDIE, JAMES STUART, EDS. NAZI-SOVIET RELATIONS 1939–1941. U. S. Dept. State Pub. 3023, 362 pp. Washington, D. C. 1948. See p. 341.

decade prior to the First World War, when exports varied between 6.0 and 14.4 million tons. The present Soviet export program, which extends beyond June 1948, is also considerably below the current export goals of the United States, which are set for the year ending June 30, 1948, at over 12 million tons of bread grains and close to 2 million tons of coarse grains and miscellaneous cereal products.

Export commitments have been made by the Soviet Union in the case of each country, separately, as a result of bilateral agreements of the clearing or barter type.

Grain commitments and shipments have been made both to the so-called satellite countries and to those outside the Soviet sphere. Even within the Soviet sphere, one must distinguish between such countries as Rumania, Bulgaria, and Poland, on the one hand, and Czechoslovakia and Finland, on the other. From the former group of countries, at least prior to the 1947 harvest, considerable quantities of foodstuffs and livestock were extracted in one manner or another by the Soviet Union, which contributed to their present plight. From Czechoslovakia and Finland, no such large acquisitions were made, though Soviet influence undoubtedly secured trading advantages in negotiation of the bilateral agreements. Total export commitments to the countries of the Soviet sphere amount to 1.6 million tons, of which Poland, Bulgaria, and Rumania accounted for 700,000 The remainder has been commited to Great Britain, Belgium, Switzerland, the Scandinavian countries, and Egypt.

Political and economic considerations have been mixed in Soviet grain-export commitments. Undoubtedly the primary objective of the Soviet Government in the satellite countries was to ward off the strong temptation that the Marshall Plan exercised, especially for Czechoslovakia and Poland. But, likewise, there is little doubt that all this grain has been, or will eventually be, well paid for in goods that the Soviet Government needs. In the case of the countries outside the Soviet sphere, the need of securing industrial equipment and raw materials appears to have predominated in Soviet trading operations in 1947–48. Nevertheless, the experience of fruitless negotiations with Italy, and particularly with France, emphasized the fact that no country can acquire Russian grain unless the Kremlin considers this as not being politically disadvantageous. In the spring of 1946, while the Communists were in the French coalition government, a grain deal was speedily concluded by the Soviets, hard pressed though they were themselves for grain. The Kremlin, however, broke off negotiations in December 1947, when the French Communists were defeated in the tug of war with the Schuman government.

TABLE 3.—*Grain export commitments* [1] *of the Soviet Union, 1947–48*

Country of destination	Bread grains [2]	Coarse grains [3]	All grains
	1,000 long tons	*1,000 long tons*	*1,000 long tons*
Great Britain		738	738
Czechoslovakia	394	197	591
Poland	256	39	[4] 492
Belgium	310	84	394
Finland	167	84	[5] 290
Egypt	213	19	232
Norway	167	20	187
Switzerland	108	49	157
Rumania	89	20	109
Denmark	59	39	98
Bulgaria	78	20	98
Sweden	64		64
Total	1,905	1,309	[6] 3,450

[1] Only firm commitments or actual shipments are included.
[2] Wheat and rye.
[3] Oats, barley, corn.
[4] Includes 197,000 long tons undesignated as to kind of grain.
[5] Includes 39,000 long tons undesignated as to kind of grain.
[6] Includes 236,000 tong tons undesignated as to kind of grain.

The Bolsheviks had early learned, from the internal history of the Soviet regime, that "food is a weapon," as Maxim Litvinov emphasized during his negotiations with the representatives of the Hoover Relief Organization in the early 1920's. They are willing to use this weapon for what it is worth. For this, recent conditions were most auspicious. Russian grain was never so much needed and highly prized as during the current season of serious food shortages and poor harvests in so many countries. And the Soviet Union was able to accumulate considerable grain supplies, albeit at heavy sacrifices on the part of the people.

By the same token, improved harvests outside of Russia, particularly in countries assisted by the Marshall Plan, should greatly diminish the potency of this weapon in the hands of the Kremlin. This would be especially true if the weather should not again favor the U. S. S. R., which so often suffers from severe droughts. Moreover, if the International Wheat Agreement should become effective in August 1948, most of the European countries will rely for their basic wheat-import needs during the next 5 years on the United States, Canada, and Australia. Last, but not least, Soviet trade with the western European countries is a two-way affair. The Soviet Government's need of western industrial products is even greater than the western countries' normal need of Russian grain, which in 1947–48 will probably account for less than 10 percent of total grain imports of western Europe. There is reason to believe, therefore, that the future potentialities for "political" grain exports may be considerably curtailed.

The Middle East Challenges Modern Agricultural Technology

Traditional seat of an ancient husbandry and home of many of the world's great crops—the Middle East offers a fruitful field for United States technical collaboration in a new development of agriculture.

by AFIF I. TANNOUS

Collaboration in agriculture will be a major field of operation within the scope of Public Law 402. [1] Technical knowledge in the field of agriculture is a resource in which the United States is extremely rich, and which tends to increase through use and by sharing with others. The Middle East is one of several critical areas of the world which have tremendous undeveloped agricultural resources, where the application of technical and scientific knowledge would certainly bring about important and permanent results. Agricultural production in these areas could be increased to such an extent as to satisfy domestic food needs and, in some cases, to provide a surplus that is much needed elsewhere.

During the past 2 or 3 years, many requests for aid in the field of agriculture have been received from the various countries of the Middle East. They are all becoming increasingly conscious of the predominant role played by agriculture in their national economies. They are convinced that the stability of their national existence depends to a large extent upon the realization of their agricultural potentials. Until a few months ago the United States was not in a position to respond thoroughly and effectively. The passing of Public Law 402 now opens the door wide for effective agricultural collaboration with these countries.

What are the possibilities for further agricultural development in the region? What could a collaborative program involving American technical aid be

[1] For a detailed discussion of this legislation, see FOREIGN AGRICULTURE for April 1948.

Agricultural labor in Lebanon, as in other parts of the Middle East, is cheap and relatively inefficient. Farm machinery is needed.

Ancient irrigation system in Lebanon.

expected to accomplish? In the first place, there are tremendous possibilities for development by means of increasing the land under cultivation. This will be achieved mainly through the expansion of present irrigation systems. Land that is suitable for more intensive cultivation under irrigation is abundant. Equally abundant are available water resources. The problem, therefore, is mainly a matter of applying modern technology, in order to bring these two great resources into a fruitful combination.

Naturally, the execution of the necessary irrigation projects on a large scale would involve large capital expenditures that would fall outside the operational scope of Public Law 402. Such capital will have to be supplied by the countries concerned either from their own resources, or through loans from abroad. Aid under the bill, however, might consist of highly specialized technical advice and guidance, which would assure the effectiveness of the irrigation schemes.

In Egypt, population pressure on cultivated land is the highest in the world, about 1,500 people for each square mile. Efficient utilization of arable land under irrigation has been carried on for many years. There is, however, still room for expansion. It is estimated that the cultivated area could be ultimately increased from the present 5,500,000 acres to 7,000,000. This possible increase is indeed significant, if one remembers that a cultivated acre in Egypt gives on the average one and a half crops a year. If such a possibility is realized, it will constitute a major contribution toward achieving the solution of Egypt's great problem.

Relative to its small size, Lebanon has promising possibilities for agricultural expansion. The cultivated area of some 500,000 acres could ultimately be doubled, most of which would be under irrigation. The water resource of this country is abundant. Most of it is now going to waste.

On a much greater scale, it is possible to increase the cultivated area in Syria. Here is a country that is sparsely populated (about 3,500,000 people) with a total area of some 60,000 square miles. The land under crops any one year does not exceed 4,000,000 acres, which could ultimately be increased to some 10,000,000 acres or more. Of this total, from 3,000,000 to 5,000,000 acres would be under irrigation instead of the present 500,000 acres.

In Iraq we find a country that has one of the greatest agricultural potentials of the world. The tremendous valley of the two great water systems of the Tigris and the Euphrates poses a challenge to modern technology and offers great promise to a hungry world. This is the country that, in earlier times, supported some 15,000,000 to 20,000,000 people. At present its population does not reach the 5,000,000-mark, and its crop area does not exceed 6,000,000 acres. Various authentic estimates agree that this could be increased to at least 20,000,000 acres, most of which would be under irrigation. It is indeed a tragic anomaly that Iraq should be facing this year a critical shortage of wheat.

Significant possibilities, to one extent or another, exist also in Turkey, Iran, Afghanistan, Saudi Arabia, Yemen, Ethiopia, and the Sudan. Turkey, for example, could increase its crop area from the present 25,000,000 to some 40,000,000 acres. Saudi Arabia could grow most of its food requirements in-

Pistachio orchards in northern Iraq.

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This contribution was made possible by funds provided through the United States Interdepartmental Committee on Scientific and Cultural Cooperation.

stead of having to import over 50 percent of the food its people consume. A convincing illustration of what could be done, even in such a semiarid country, is afforded by the flourishing irrigation project at Al-Kharj, near Riyad, the capital. This project has been realized through the application of modern technology at the hands of specialized American personnel, under the joint sponsorship of the Arabian American Oil Company and the Saudi Arabian Government. His Majesty King Abdul-Aziz Al-Saud has become so convinced of the validity of this form of constructive collaboration that he has indicated his desire to secure the services of a much larger number of United States agricultural specialists. They would assist in the development of four or five projects similar to that of Al-Kharj.

Increasing the area of land under cultivation, as discussed above, does not by any means exhaust the possibility of agricultural development in the Middle East. There is an equally great chance for improvement through the application of more efficient techniques of production. It is in this field that we see the most direct challenge to modern science and technology.

The breeding of improved seed and superior plant varieties, in order to attain the highest possible yields under various local conditions, is still a young and relatively undeveloped technique in the Middle East. It has been well applied to a few specialized crops, such as cotton, dates, and citrus, in some countries of the region. Much more, however, should and could be done in order to extend its application to such staple food and feed crops as wheat, barley, corn, grain sorghum and legumes, and various vegetables and fruits. The increase in yield and total production would undoubtedly be great.

Similarly, in the field of livestock raising, the margin for improvement is great. For the past few years, the Egyptian Ministry of Agriculture has been working seriously on a project for increasing milk production from the water buffalo, the mainstay of the Egyptian peasant. The ultimate goal is to double milk production, badly needed by the undernourished peasant masses. The leaders in charge of the project are well-qualified, but they are too few, and their facilities are inadequate to cope with such a major undertaking. Any technical assistance rendered Egypt along this line would constitute an important step in the direction of solving the national food problem.

The same is more or less true of all the countries of the Middle East. By approved standards, the milk yield per animal, whether cow, buffalo, goat, or sheep, is indeed poor. Total milk production falls far short

Bread is the staple diet of most people in the Middle East.

of supplying the people with their need of this vital food source. Qualified personnel, utilizing proved techniques for the improvement of local breeds and for the introduction of new breeds, could greatly increase the milk supply.

In years of severe drought, which are not infrequent, as well as in years of severe cold, heavy losses are sustained by livestock in many parts of the region. In 1942 and 1943 Turkey suffered such heavy losses. Millions of sheep and goats perished. Last year drought struck livestock in Syria and Saudi Arabia. Surely there must be an adequate solution of this serious problem. Perhaps further investigation will show that this wastage of the livestock resource could be prevented, or minimized, by making water, surplus feed, and simple shelters available at strategic points in each of the countries concerned.

Various pests and diseases play costly annual havoc with plant and animal life in the Middle East. Wheat smut and rust, locusts, the Mediterranean fruit fly, field mice, foot-and-mouth disease, the "Sunn" insect, mildew of grapes, citrus scales, aphids, and internal and external parasites of animals are examples. Application of the combined knowledge in the fields of pathology, entomology, veterinary medicine, and chemistry is certainly greatly needed. The governments and farmers of these countries are aware of this serious problem, but they do not have the necessary number of qualified personnel or the technical facilities to cope with it adequately. Technical assistance in this field would be timely and would bring about important results within a relatively short time.

American farm machinery is already established in the region, although on a relatively very limited scale. Its efficiency has been proved. Much more of it is needed and is desired. It is by means of this machinery that the prevailing vicious circle—inefficient

labor, undeveloped resources, low standards of living—could be ultimately broken. The solution of this problem, however, could not be achieved by merely making the machines available.

Other serious considerations are involved. Some experimentation will have to be undertaken by competent personnel, in order to make sure that agricultural machinery will be used judiciously and be adaptable to local conditions. Long-range aftereffects should be kept in mind, especially with regard to soil erosion and the depletion of fertility. There will also be a great need for the development of comprehensive programs of short courses for the training of local people in the use and repair of such machinery. Again this calls for technically trained personnel.

Furthermore, there will be the very serious question to ponder: Will the expected increase in production be utilized effectively for raising the standards of living among the peasant masses? An affirmative answer to this question requires work in several related fields, such as land utilization, crop diversification, diet, agricultural credit, and extension work. Turkey has already taken promising steps in that direction, including the distribution of land to landless peasants, in accordance with a land-reform law passed about 3 years ago. In Iraq projects are in operation that aim at the distribution of land among tribal people. Egypt and other countries of the region are becoming increasingly conscious of this serious problem—the problem of the peasant majority of the population who are landless and whose levels of living are among the lowest in the world. The extension of assistance to the Middle East in the field of social science, especially rural sociology and agricultural economics, will be timely, fundamental, and fruitful, in connection with application of advanced techniques in the physical and biological sciences.

So far consideration has been given to only one side of this international cooperative relationship—that of the benefits accruing to one of the two parties concerned, the Middle East. An equally important aspect of the relationship is that of the United States, which stands to gain much, both directly and indirectly, in a program of technical collaboration. In fact, it is this principle of *mutual benefit* that gives Public Law 402 its strength and grounds it in realism.

The United States has often pledged itself to the policy of cooperating with other nations in order to relieve the world from the threat of hunger. This is firmly established, on the basis of humanitarianism and enlightened self-interest, and the Government is already engaged in its implementation. As indicated above, through the realization of its great agricultural potential, the Middle East will be in a position to render valuable support to the United States effort in this respect. It could solve its own food problem, about which the United States is currently concerned, and it could produce a surplus for export.

Social, economic, and political stability in the Middle East is of vital concern to the United States and other countries. The continuance of the present conditions of poverty and low standards of living will

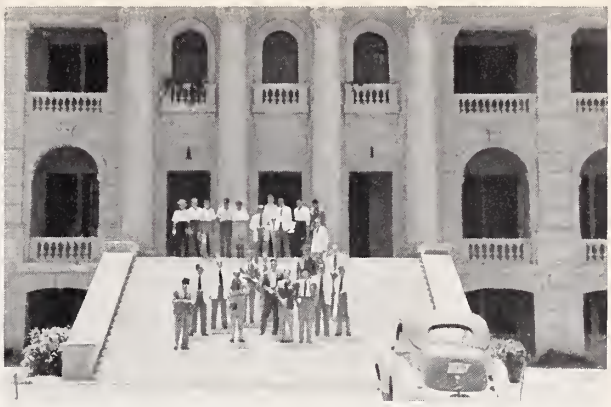
The Al-Kharj project in Saudi Arabia is the result of American irrigation and production techniques.

tend to accentuate any instability in the region. This carries a grave threat to United States interests and world peace. The extension of technical aid, on a long-range basis, with a view to realizing the agricultural potential of the various countries concerned, would constitute, perhaps, the most fundamental step toward obviating the danger.

Another important consideration is the matter of trade interests. We have here the case of two economies that are in general complementary. The Middle East is predominantly an agricultural region, which is lacking in the basic materials for the development of heavy industry. It has turned to the industrial West for the importation of its needs of industrial products. Since the end of the war, it has become increasingly dependent upon the United States in this respect. American industrial products of practically all types and makes are now firmly established in the markets of the region. They are badly needed and eagerly sought. However, the ability of the Middle East to continue such imports, and probably increase them, will depend to a very large extent upon increasing certain agricultural exports that are needed in this country. A well-conceived program of agricultural collaboration could very well be directed toward this end, to the mutual benefit of both sides.

Although not widely known, it is a well-substantiated fact that the Middle East is the original home of a large number of the more important plants that have been domesticated by man. The world owes this region a heavy debt in this respect. Wheat, barley, grain sorghum, olives, dates, coffee, and deciduous fruits are examples. On the basis of this peculiarly abundant botanical background, a reasonable assumption is that the region is rich with plant germ plasm. Scientific observations tend to corroborate this assumption, and the field certainly calls for more systematic exploration and experimentation. Important discoveries might be made, which would be valuable scientifically and economically. This task could very well be achieved by American scientists and technicians working in cooperation with local personnel in projects of agricultural development.

Similarly, it is quite reasonable to expect that American technology stands to gain by being applied and tested under new conditions, such as obtain in the Middle East. United States agricultural machinery and methods of cultivation have evolved to their present high efficiency as a result of rigorous experimentation and testing. Peculiar conditions of a new environment—physical and cultural—will certainly provide the chance for further improvement. Will the



New agricultural college at Alexandria, Egypt. About 90 percent of the faculty are graduates of United States institutions

American tractor do an efficient job in the extremely hot semidesert areas of central Arabia? What improvements might it need in order to meet this new test successfully? The people of the region in general claim that the track-laying tractor is more efficient than the wheel type. Is there a factual foundation for this preference? What are the factors involved?

Successful crop-rotation systems have been developed for American crops and conditions. Crop rotation is also practiced in the Middle East, developed during thousands of years of experience in agricultural production. How do the two systems compare? Is there something in that age-old practice of the Middle East which might suggest some line of further improvement in the scientifically developed American system?

Since time immemorial man has practiced irrigation in the great valleys of the Nile, the Euphrates, and the Tigris. Ingenious irrigation systems once flourished in the Hijaz of Saudi Arabia and in the Yemen. Irrigation, in fact, has been the main foundation on which great civilizations developed in that part of the world. It is quite likely, therefore, that American technicians, helping in the development of new irrigation projects in the region, will gather valuable information that could be usefully applied in the United States.

Perhaps superseding all these considerations is one major accomplishment that would certainly result from a long-range program of collaboration. This is the development of international understanding and good will on a solid and permanent basis. The most promising way to attain this objective is for peoples to join effort and work together on accomplishing a variety of positive, constructive projects, resting on the principle of sharing of knowledge and on voluntary cooperation. Here is, indeed, a historical challenge.

International Wheat Agreement

by R. L. GASTINEAU

On March 6, 1948, an International Wheat Agreement was opened for signature at Washington, D. C., by the delegates of 36 countries which account for the bulk of the world trade in wheat. It is a unique document—combining the aspects of a commercial contract with a multilateral agreement between governments. The Agreement was signed on behalf of the United States delegation by Norris E. Dodd, Under Secretary of Agriculture. On that occasion, commenting on the significance of the Agreement to the world wheat economy, Mr. Dodd said in part:

> It provides for maintaining a high level in world wheat trade and consumption. Importing countries are assured of ample supplies at fair prices. And the farmers of exporting countries are assured of markets at fair prices. No more practical and concrete action could be taken towards early and lasting improvement of the basic world food problem.

In a recent statement on the significance of the Agreement to American agriculture, Secretary Anderson stated:

> For the United States, a major wheat exporter, the agreement has great potential significance in a long-range national agricultural policy aimed at the basic objective of organized, sustained, and realistic abundance. Markets which the agreement would help to assure would absorb our present high-level production of over a billion bushels of wheat annually, and thus minimize any need to consider wheat-production restrictions.

The Agreement represents the culmination of many years of effort on the part of the International Wheat Council and its predecessor organization, the Wheat Advisory Committee, which was first organized in 1933. There follows a summary of its main provisions, together with a brief historical review of events leading up to the present document.[1]

Summary of Agreement

PREAMBLE: "The Governments on whose behalf this Agreement has been signed,

"Recognizing that there is now a serious shortage of wheat, and that later there may be a serious surplus;

"Believing that the high prices resulting from the present shortage and the low prices which would result from a future surplus are harmful to their interests, whether they are producers or consumers of wheat; and

"Concluding therefore that their interests, and the general interest of all countries in economic expansion, require that they should cooperate to bring order into the international wheat market,

"Have agreed as follows:"

OBJECTIVES: "To assure supplies of wheat to importing countries and to assure markets to exporting countries at equitable and stable prices."

ENTRY INTO FORCE: Subject to approval of the governments concerned, the Agreement will come into force on August 1, 1948. In the case of the United States, participation in the Agreement will be subject to Congressional approval.

DURATION: The Agreement is of 5-year duration—from August 1, 1948, to July 31, 1953. Provision is also made for the International Wheat Council to communicate to contracting governments, not later than July 31, 1952, its recommendations regarding renewal of the Agreement.

TABLE 1.—*Annual guaranteed purchases, by importing countries, under International Wheat Agreement*

Importing countries	August-July year	
	In metric tons	Approximate equivalent in bushels
	Thousands	*Thousands*
Afghanistan	20	735
Austria	510	18,739
Belgium	650	23,883
Brazil	525	19,290
China	400	14,697
Colombia	60	2,205
Cuba	225	8,267
Czechoslovakia	30	1,102
Denmark	40	1,470
Dominican Republic	20	735
Ecuador	30	1,102
Egypt	190	6,981
French Union and Saar	975	35,824
Greece	510	18,739
Guatemala	10	367
India	750	27,557
Ireland	360	13,227
Italy	1,000	36,743
Lebanon	75	2,756
Liberia	1	37
Mexico	200	7,349
Netherlands	835	30,680
New Zealand	150	5,511
Norway	205	7,532
Peru	110	4,042
Philippines	170	6,246
Poland	30	1,102
Portugal	120	4,409
South Africa	175	6,430
Sweden	75	2,756
Switzerland	200	7,349
United Kingdom	4,897	179,930
Venezuela	60	2,205
Total (33 countries)	13,608	499,997

SCOPE: The Agreement currently includes 33 importing countries, among which are all the important wheat importers (table 1); and 3 of the principal

[1] Copies of the text of the Agreement are available in the Office of Foreign Agricultural Relations, U. S. Department of Agriculture, Washington 25, D. C.

Norris E. Dodd, head of the United States delegation, signs the International Wheat Agreement for the United States. Looking on are (left-right): S. T. Raja, adviser, R. L. Gupta, alternate delegate, and J. Vesugar, head of the delegation, from India; Andrew Cairns, Secretary of the Wheat Council; C. Caranicas, head of the delegation from Greece; T. O'Connell, head of the delegation from Ireland; C. F. Wilson, head of the delegation from Canada; L. A. Wheeler, Chairman of the Council; E. G. Cale, delegate from the United States.

wheat-exporting countries, Canada, Australia, and the United States. The U. S. S. R. and Argentina are not parties to the Agreement. Provision is made for the accession of additional countries subject to unanimity of the votes cast by member governments of the International Wheat Council.

QUANTITIES: The Agreement provides that exporting countries agree to sell and importing countries collectively agree to purchase, within the agreed price range, a total of 500 million bushels per year. Of this total, Canada will supply 230 million bushels, Australia 85 million, and the United States 185 million bushels (table 2). These quantities include wheat moving in the form of wheat flour, provided that the price for such flour is consistent with the basic maximum and minimum prices established for wheat.

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TABLE 2.—*Annual guaranteed sales, by exporting countries, under International Wheat Agreement*

Exporting countries	August–July year	
	In metric tons	Approximate equivalent in bushels
	Thousands	*Millions*
Australia	2,313	85
Canada	6,260	230
United States	5,035	185
Total	13,608	500

In the case of the United States, the guaranteed sales of 185 million bushels do not include "the minimum requirements of wheat of any occupied area for which the United States has or may assume supply responsibility." Thus the requirements in the zones of military occupation of Europe and the Pacific, together with small quantities for nonsignatory countries, in addition to the guaranteed sales under this Agree-

ment, will call for total annual exports of wheat from the United States considerably above 185 million bushels.

ADJUSTMENT OF OBLIGATIONS: The Agreement provides for adjustment of the obligations of any country prevented by circumstances from carrying out its obligations and other responsibilities under the Agreement. These provisions are intended to cover such cases as a short crop in an exporting country or the necessity to safeguard balance of payments or monetary reserves in the case of an importing country.

In a case of critical need, provision is also made whereby an individual contracting government may appeal to the Council for assistance in obtaining supplies of wheat in addition to its guaranteed quantity. This provision would be invoked only in cases of extreme emergency (similar to the severe 1946–47 winterkill of wheat and the subsequent 1947 drought in western Europe), to provide a safeguard against unforeseen disasters.

In the case of the United States, it is also recognized that with regard to minimum requirements of wheat of any occupied area for which the United States has or may assume supply responsibility, the necessity of meeting these requirements will be one of the factors considered in determining the ability of that country to deliver its guaranteed sales under the Agreement.

PRICES: "The basic minimum and maximum prices for the duration of this Agreement for No. 1 Manitoba Northern wheat in store Fort William/Port Arthur shall be," as follows:

	Minimum	*Maximum*
1948–49	$1.50	$2.00
1949–50	1.40	2.00
1950–51	1.30	2.00
1951–52	1.20	2.00
1952–53	1.10	2.00

For the purpose of advising the Council on prices equivalent to the foregoing basic maximum and minimum prices, and computed under the formula established for any other description of wheat, a standing Technical Advisory Committee on Price Equivalents will be established. This Committee will consist of representatives of the Governments of Australia, Canada, the United States, and the United Kingdom and representatives of at least two other importing countries. The equivalent price prevailing at a particular time, or shipping point, for any description of wheat will be subject, of course, to transportation and exchange rates prevailing at that time. It will also be subject to such allowance for difference in quality as may be mutually agreed upon by the importing and exporting parties concerned.

TABLE 3.—*Example of computation of wheat equivalent prices, based on maximum and minimum price formula of the Wheat Agreement under conditions as of mid-February 1948*

[Cents per bushel]

Exporter	Destination					
	Western Europe		India, Ceylon, etc.		Brazil	
	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum
UNITED STATES						
No. 1 Hard Winter f. o. b. Gulf ports	211½	161½	212½	161½	215	161½
No. 1 Hard Winter f. o. b. Atlantic ports	214½	164½	214½	164½	215	164½
No. 1 Soft White/No. 1 Hard Winter f. o. b. Pacific ports	200	145½	200	145½	200	145½

It is difficult, therefore, to translate the foregoing basic maximum and minimum prices to an equivalent basic price for wheat in the United States. An example (table 3), however, will illustrate how the price formula would operate as of the day the example was computed. It is emphasized that the example does not attempt to forecast price equivalents for the duration of the Agreement. It does no more than illustrate the formula on the basis of freight and exchange rates ruling in mid-February 1948, and does not provide for such quality discount as may be mutually agreed upon by the parties concerned. The minimum prices shown are based on the basic minimum price for the first year of the Agreement. For the remaining years, the minimum price would decline 10 cents per bushel each succeeding year.

STOCKS: Whenever there are available supplies of wheat which are not needed to meet domestic requirements or to discharge obligations under the Agreement, provision is made that exporting countries maintain stocks of old wheat held at the end of their respective crop years as follows: Australia, 25 million bushels; Canada, 70 million bushels; and the United States, 170 million bushels. In the case of Canada and Australia, the total represents commercial stocks, whereas that for the United States represents the total carry-over (including farm stocks). In addition to these quantities, both exporting and importing countries shall operate price-stabilization reserves up to 10 percent of their respective guaranteed quantities. These reserves are to be accumulated when free-market prices are below the basic minimum prices and to be sold, or utilized, as soon as free-market prices are above the basic maximum price.

THE COUNCIL: For the purpose of administering the Agreement, an International Wheat Council is estab-

lished. Each contracting Government shall be a member of the Council and may appoint one delegate and one alternate. Each contracting Government also undertakes to accept as binding all decisions of the Council under the provisions of the Agreement.

POWERS AND FUNCTIONS OF THE COUNCIL: The Council is charged with responsibility for performing the duties assigned to it under the Agreement. The Agreement also confers such powers, in addition to those expressly conferred, as may be necessary to achieve effective operation of the Agreement and to realize its objectives. This authority, in turn, must depend upon mutual cooperation and agreement within the Council itself, as a self-governing body, in resolving any differences which may arise.

VOTING PROVISIONS: Delegates of importing and exporting countries shall each hold a total of 1,000 votes. These votes are in each case to be distributed between the importing and exporting countries in the proportion that each country's guaranteed purchases, or sales, bears to the total of the guaranteed purchases, or sales. With the Agreement in its present form, this means that the United States would hold 370 votes, or 37 percent of the total votes held by the exporting countries. It follows that in any case where a two-thirds majority of the importing and exporting countries, voting separately, is required, agreement by the United States, among others, would be necessary to decide an issue.

EMERGENCY ALLOCATIONS PROVISIONS: The following resolutions, unanimously adopted by the Council, were recorded in the minutes of the final meeting of the special session of the International Wheat Council on March 6, 1948:

Resolution No. 1—The Special Session of the International Wheat Council, held in Washington January–March 1948, hereby instructs its Secretary to inform the International Emergency Food Committee of the FAO Council that as the figures in Annex I to Article II of the International Wheat Agreement, signed in Washington in March–April 1948, do not represent the total requirements of the signatory countries they should not be regarded as a measure of these countries' needs.

Resolution No. 2—The Special Session of the International Wheat Council, held in Washington January–March 1948, recognizes that the International Emergency Food Committee of the FAO Council is the appropriate body to recommend the international distribution of wheat and other grains used for human consumption during the continuation of the present severe food emergency, and that international trade in wheat and other grains during this emergency should be in accordance with that Committee's recommendations, provided that the recommended distribution of wheat to no country is less than its guaranteed purchases under the International Wheat Agreement after adjustments, if any, effected in accordance with the provisions of Article V of that Agreement.

Historical Review

The first steps in the evolution of a Wheat Agreement were largely exploratory. One of the original ideas in the founding of the International Institute of Agriculture in 1913 was that it should give attention to international commodity problems at its general assemblies and through special committees or international conferences. The Institute held the so-called first world wheat conference in 1927, at which wheat-policy questions received special consideration.

During the decade after World War I overseas exporting countries, including the United States, enjoyed a period of active wheat exports at reasonably good prices. By 1929–30, however, the trend of production both in importing and exporting countries had reached a point where surpluses were beginning to accumulate. Following closely on this trend, the world-wide agricultural and economic depression of the early 1930's brought on a wheat-surplus problem of the first magnitude.

During this period, many international meetings and conferences were held that were partly, or wholly, concerned with the problem of wheat surpluses. For the most part these meetings were of a regional nature and were directed to an examination of this problem, particularly as related to Europe. In March 1931, however, a full conference was arranged by the International Institute of Agriculture in Rome with 48 countries participating. While nothing tangible resulted from these efforts, they helped to clear and to crystallize various aspects of the problem. They also marked the development from a regional European approach to a world-wheat-conference basis.

The next important step in the evolution of wheat-agreement activities came in May 1933 in connection with the world monetary and economic conference held in London. After a series of meetings, a Wheat Agreement was signed on August 25, 1933, by delegates of 21 countries, which included most of the principal wheat-importing, as well as wheat-exporting, nations. This agreement provided for export quotas during a 2-year period beginning August 1, 1933, as well as a commitment by the importing countries to cease efforts to expand their wheat production and to remove tariff and trade barriers gradually when world wheat prices reached a more normal level.

It was at this time that the International Wheat Advisory Committee was established. The 1933 agreement proved noneffective, and virtually all provisions lapsed the following year. The Wheat Advisory Committee remained, however, as a medium or clearing-

house for further international wheat discussions until the outbreak of war in September 1939.

The 1933 Agreement had two important factors in its favor; namely, signatory countries accounted for the large bulk of the world wheat trade and both importing and exporting interests were represented. On the other hand, the Agreement lacked the necessary flexibility to handle unusual developments. It covered too short a time to permit adopiton of effective adjustment or control programs, and the wheat industry in important exporting countries was not yet organized effectively for adherence to such an agreement. Furthermore, the unusual drought period that occurred in North America soon altered the surplus situation.

Although the 1933 Wheat Agreement officially lapsed in 1935, meetings of the Wheat Advisory Committee continued to be held to review developments and to consider special problems. It was generally recognized that the world wheat problem had only been relieved temporarily by the unusual droughts and crop failures, and by 1938–39 it was again evident that another wheat crisis was in the making. In considering what action should be taken, the Wheat Advisory Committee met in London in January 1939, and a Preparatory Committee was appointed to draft a new wheat agreement. The work of this Committee was practically completed when war broke out.

The war brought with it a rapid intensification of the wheat crisis. In the face of increasing surpluses in exporting countries and the prospect of no immediate relief, meetings were arranged for early in July 1941 by the United States with Canada, Australia, Argentina, and the United Kingdom. From these meetings, known as the Washington Wheat Meetings, in July 1942 came two documents: (1) A Memorandum of Agreement and (2) a Draft Convention.

The Memorandum of Agreement, which came into effect June 27, 1942, represented an understanding among the Governments of the five participating countries regarding a course of action to be followed with respect to wheat during the unsettled war period and during the first part of the postwar period, pending a more inclusive wheat conference. It was in effect an Interim Agreement.

The Draft Convention contained the proposed plans for stabilizing world trade in wheat in the postwar period. It constituted at that time a record of the five Governments' views regarding a new world wheat agreement. In general, it may be said that these documents formed the basis for the present Agreement, although their original provisions have been changed in many important respects.

Following World War II, it was not until July 1946 that formal efforts were again made to write a new agreement. A series of preparatory meetings were then held which culminated in an International Wheat Conference held in London in March–April 1947. While substantial progress toward an agreement was made at that conference, a lack of unanimity on such points as the duration of the proposed agreement and the range of prices prevented a completely successful conclusion of the conference. It was during this time that the Council's membership was expanded to 25 governments. It was during this time also that the Council agreed to try again the following year. Accordingly, this was done, and on March 6, 1948, the present Agreement was opened for signature.

INTERNATIONAL *Agricultural News*

Sweden Extends Cooperation To Milk Production

Largely as an experiment, Sweden has recently applied the principle of cooperation to milk production. In 1944, a group of farmers formed an organization to operate a cooperative dairy barn in Bjärme, a village in the northern section of the country. The barn is jointly owned by 11 farmers who individually own and operate a combined tract of about 125 acres of arable land and about 1,600 acres of other land, mostly forested. The membership of the group includes nearly a third of the farms in the village.

The barn has space for 80 cows, 30 heifers, 10 calves, and 2 bulls. It is well equipped with modern labor-saving devices. The cost of construction amounted to around $50,000. Close to 17 percent was contributed by the Government and 27.7 percent by the Consumers' cooperatives as grants or gifts. The remainder was financed by a state loan, secured by mortgage, and by member contributions amounting to around 15 percent.

The experiment has been in operation for too short a time to evaluate its success, but the Swedish Government is encouraging such projects to serve as test cases. Among the advantages of the cooperative operation of the dairy barn are the following: (1) Saving in capital investments in buildings and equipment, especially in areas with old barns that need extensive remodeling or reconstruction; (2) increased efficiency in milk production, especially with regard to more efficient utilization of labor; and (3) reduction of the work load of the farm woman, who is given more time for the home and for such operations as poultry raising.

When certain disadvantages have been overcome, the hope is that the undertaking will prove entirely

successful and will serve as a model should similar enterprises be established in other localities.

FAO Nutrition Conference in Uruguay

The Food and Agriculture Organization has invited all Latin American countries to send representatives to a regional conference on nutrition to be held in Montevideo, Uruguay, in July. Delegates have been invited from 18 Latin American countries and from France, the Netherlands, the United Kingdom, and the United States. Argentina, which is not an FAO member, and interested international organizations have been invited to send observers.

The conference will be in the interest of providing a more healthful diet for Latin American countries, in many of which serious malnutrition exists as a result of deficiencies of protein, certain minerals, and vitamins. A basic question to be discussed is the development and proper orientation of agriculture in Latin America. The serving of special meals, such as school lunches, will be encouraged. Plans for education of the public in nutrition, food conservation, and preservation of the nutritional value of food, the training of workers in nutrition programs, and for the improvement of nutrition in selected demonstration areas will be formulated.

This will be the second of a world series of conferences on nutritional problems planned by FAO at the Geneva Conference last year. The first was held in the Philippines in February and was concerned primarily with ways and means of improving rice diets in southeastern Asia.

Canada Renews Farm Improvement Loans Act

Just before its expiration on March 1, 1948, the Farm Improvement Loans Act was renewed by the Canadian Government, with two amendments. Under the original act, and as amended, loans to farmers are made to enable them to buy modern equipment or livestock and make improvements on farm buildings and equipment. The first amendment extends the operation for 3 years, beginning March 1. The second broadens the field of loans with regard to the security that may be taken.

Previously mortgage security could be taken only when the loans exceeded $2,000 and the period for repayment was longer than 5 years. Now mortgage security may be taken if the loan is made for financing the construction or repair of farm buildings, of if the loan is made for any other purpose, exceeds $2,000 in amount, and extends for longer than 5 years.

The new legislation authorized the chartered banks of Canada to make loans up to a total of $250,000,000. The maximum amount of a loan to an individual farmer is $3,000, with interest at 5 percent. The repayment periods are from 1 to 10 years. In most cases the loan is for 75 percent of the cost of the purchase or project. For the construction or repair of farm buildings, it may be up to 90 percent of the cost of the construction and may be made to either an owner or tenant.

YERBA MATÉ

Yerba maté or yerba de maté, also known as Paraguay-tea, is a plant whose leaves are prized in South America for beverage making. This beverage is similar in taste and chemical composition to tea and likewise has a stimulating and refreshing effect on the drinker. The tree is a kinsman of the holly and grows from Bolivia and Mato Grosso, Brazil, to northern Uruguay and the Argentine Province of Corrientes. The beverage is most commonly made from the leaves of the species *Ilex paraguariensis*.

The yerba maté tree prefers ravines or depressions in the foothills and mountains at elevations of from 1,500 to 2,500 feet, a damp humid climate, and deep, alluvial soil containing large amounts of humus. The Paraná pine is usually a close neighbor in the forest, sometimes providing shade for the yerba maté tree. Brazil is the principal producer of maté, followed by Argentina and Paraguay. Most of Brazil's maté production comes from wild forests, where the trees sometimes grow to a height of 80 or 100 feet. When grown on plantations, the trees are usually pruned and range from 12 to 30 feet in height.

Harvesting begins when the tree is 4 or 5 years old and is carried on from May to October when the leaves are dry. Leaves are gathered from the same trees preferably not oftener than every second or third year. Workers cut the small branches, toast the leaves evenly by holding the branches over a bonfire, and then place them in a barbacuá or ovenlike structure for drying. The mass of branches and leaves is stirred frequently during the 4- or 5-hour drying process, after which it is taken to the threshing floor. After the leaves are separated from branches and other waste material, they are finely ground, sifted, and graded.

Maté has not yet gained popularity outside South America. That imported into the United States in 1947, for example, totaled only 21,000 pounds, compared with 67,448,000 pounds of tea and 2,500,000,000 of coffee. It is a "must" item, however, in the daily diet of many of our neighbors in Argentina, Brazil, Paraguay, and, to a less extent, in Uruguay and Chile. Prewar production of maté amounted to 368,000,000 pounds, approximately one-fourth as much as the world tea output.

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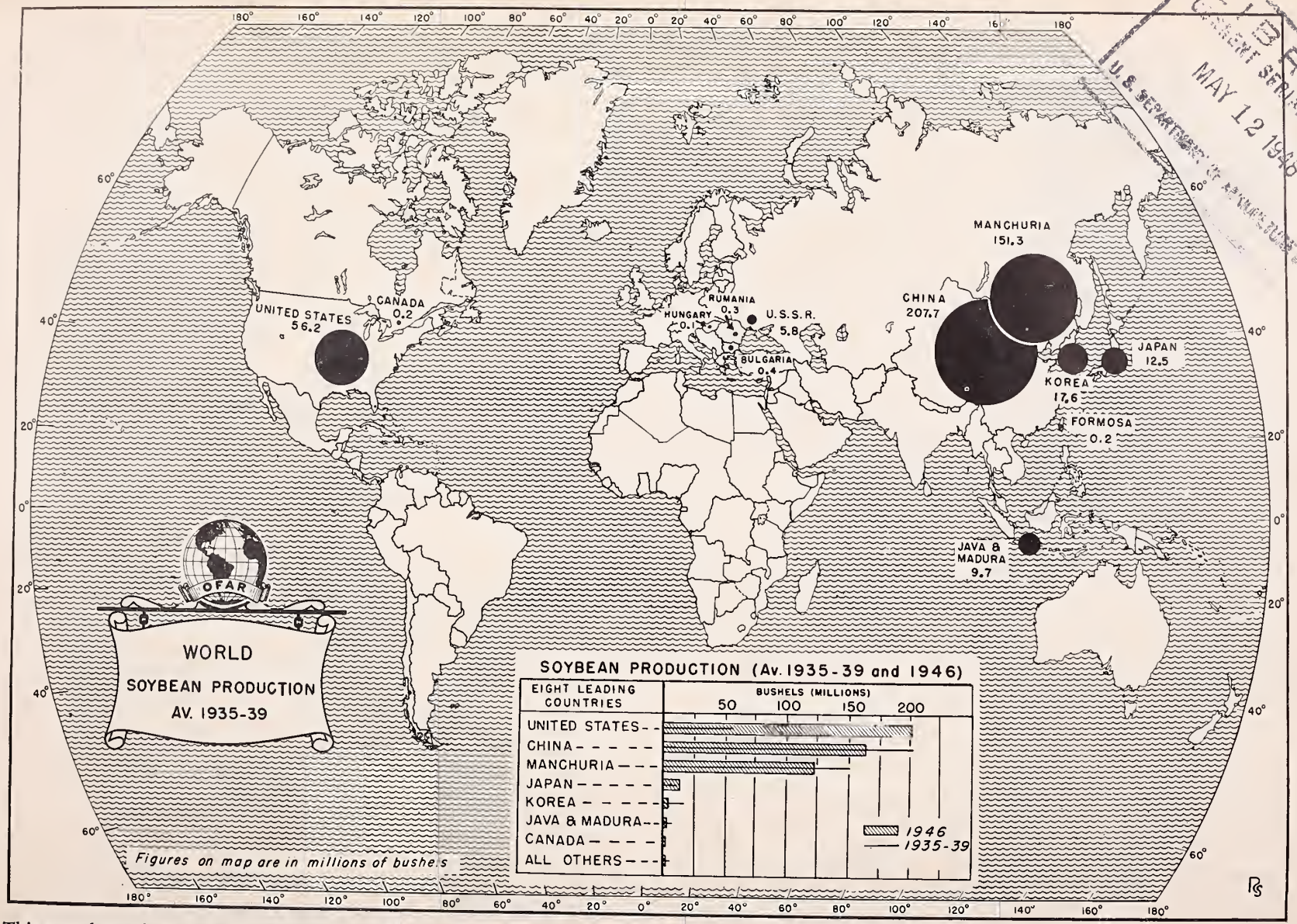

This map shows the average annual soybean production during the prewar period 1935–39, with the area of the circle varying from country to country according to the production. The change in world soybean production from the prewar period to 1946, as shown in the inset chart, is very significant. United States average annual production of soybeans during 1935–39 was 56.2 million bushels, whereas in 1946 it was 201.3 million bushels or nearly four times as much. This increase in United States production more than made up for decreases in China, Manchuria, Korea, etc., during the same period. Such a phenomenal increase in United States soybean production enabled this country to advance from a weak third place in prewar world production to undisputed leadership in 1946.